

I Claim:

1. A method of separating an immunoreactive compound from at least one immaterial component in a fluid mixture 5 using simulated moving bed chromatography which comprises the steps of:

(a) providing a simulated moving bed apparatus that comprises a plurality of modules in fluid conducting communication, said modules comprising at least one solid 10 phase;

(b) continuously introducing the fluid mixture into said simulated moving bed apparatus wherein the fluid mixture contacts the solid phase in a countercurrent mode;

(c) effecting separation of the immunoreactive 15 compound from at least one immaterial component; and

(d) collecting the immunoreactive compound to provide a purified composition thereof.

2. A method according to claim 1 wherein said immunoreactive compound associates with the solid phase to a 20 greater or lesser degree than at least one immaterial component.

3. A method according to claim 2 wherein the immunoreactive compound associates with the solid phase to a greater degree than at least one immaterial component.

25 4. A method according to claim 3 which further comprises the step of effecting said separation by contacting said solid phase with an eluent that promotes disassociation of the immunoreactive compound.

5. A method according to claim 4 wherein said solid 30 phase comprises a support material associated with Protein A or Protein G.

6. A method according to claim 5 wherein said eluent comprises an acidic buffer.

7. A method according to claim 1 wherein separation is effected using adsorption chromatography, partition chromatography, ion exchange chromatography, size exclusion chromatography or affinity chromatography.

8. A method according to claim 7 wherein separation is effected using affinity chromatography.

9. An immunoreactive compound prepared according to 10 the method of claim 1.

10. A simulated moving bed ("SMB") system for separating an immunoreactive compound from at least one immaterial component when both are present in a fluid mixture, wherein the SMB system incorporates a plurality of 15 zones comprising a solid phase which is contacted countercurrently by said fluid mixture and wherein said zones comprise: 20 an association zone wherein the immunoreactive compound and at least one immaterial component differentially associate with the solid phase; 25 a first wash zone wherein at least one immaterial component is preferentially disassociated from the solid phase; and an elution zone wherein the immunoreactive compound is 30 preferentially disassociated from the solid phase.

11. A simulated moving bed system according to claim 10 wherein said first wash zone is intermediate between said association zone and said elution zone.

12. A simulated moving bed system according to claim 30 10 wherein said solid phase preferentially associates with said immunoreactive compound.

13. A simulated moving bed system according to claim 12 wherein said solid phase comprises a ligand for affinity chromatography.

14. A simulated moving bed system according to claim 5 13 wherein said solid phase comprises Protein A or Protein G.

15. A simulated moving bed system according to claim 12 wherein said solid phase comprises a cation exchange resin.

10 16. A simulated moving bed system according to claim 10 which further comprises an elution wash zone intermediate between said elution zone and said association zone.

15 17. A simulated moving bed system according to claim 16 which further comprises a regeneration zone intermediate between said elution wash zone and said association zone.

18. A simulated moving bed system according to claim 17 which further comprises an equilibration zone intermediate between said regeneration zone and said association zone.

20 19. A method of separating an immunoreactive compound from at least one immaterial component which comprises using the simulated moving bed system of claim 10.

20. A purified immunoreactive compound prepared using the simulated moving bed system of claim 10.

25 21. A method of treating a patient in need of treatment using an immunoreactive compound of claim 20.

22. A method of separating an antibody from at least one immaterial component in a fluid mixture where both are present using simulated moving bed chromatography which 30 comprises the steps of:

(a) providing a simulated moving bed apparatus that comprises a plurality of modules in fluid conducting

communication, said modules comprising at least one solid phase which comprises an affinity chromatography ligand which preferentially associates with the antibody;

5 (b) continuously introducing the fluid mixture into the simulated moving bed apparatus wherein the fluid mixture contacts the solid phase in a countercurrent mode;

(c) effecting separation of the antibody from at least one immaterial component; and

10 (d) collecting the antibody to provide a purified composition thereof.

23. A simulated moving bed ("SMB") system for separating an antibody from at least one immaterial component where both are present in a fluid mixture wherein the SMB system incorporates a plurality of zones comprising 15 a solid phase comprising an affinity resin which is contacted countercurrently by the fluid mixture and wherein said zones comprise:

20 an association zone wherein the antibody and at least one immaterial component differentially associate with the solid phase;

a first wash zone wherein at least one immaterial component is preferentially dissociated from the solid phase; and

25 an elution zone wherein the antibody is preferentially disassociated from the solid phase.

24. A method of separating an immunoreactive compound from at least one immaterial component in a fluid mixture using simulated moving bed chromatography comprising the steps of:

30 (a) providing a simulated moving bed apparatus which comprises at least one module in fluid conducting communication with said apparatus, said module comprising at

least one solid phase and wherein said apparatus comprises a plurality of zones through which the modules pass;

5 (b) continuously introducing the fluid mixture into the module in an association zone wherein the fluid mixture contacts the solid phase in a countercurrent mode and wherein the immunoreactive compound associates with the solid phase;

10 (c) continuously introducing a wash buffer into the module comprising the associated immunoreactive compound in a wash zone wherein the wash buffer contacts the solid phase in a countercurrent mode and substantially removes at least one immaterial component from said module; and

15 (d) continuously introducing an elution buffer into the module comprising the associated immunoreactive compound in an elution zone wherein the elution buffer contacts the solid phase in a countercurrent mode and whereby the immunoreactive compound is substantially disassociated from the solid phase; and

20 (e) continuously removing a product stream comprising the immunoreactive compound from the module.

25. A method according to claim 24 wherein said simulated moving bed apparatus comprises a plurality of modules.

26. A method according to claim 24 wherein said solid phase comprises an affinity ligand.

27. A method according to claim 26 wherein said affinity ligand comprises Protein A or Protein G.

28. A method according to claim 24 wherein said immunoreactive compound comprises an antibody.

30 29. A purified antibody prepared substantially by the method of claim 28.

30. In a method of purifying an immunoreactive compound from at least one immaterial component, the improvement which comprises using simulated moving bed affinity chromatography with a solid phase comprising  
5 Protein A or Protein G.